

Grazing Potential Index and Surface Water Quality in the State of Oregon: I. Likelihood of Animal Pathogenic Presence Using Enterococci

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Cattle grazing is a widespread and persistent ecological stressor in the Western United States. Cattle impact surface water quality by introducing nutrients and bacteria and indirectly damaging stream banks or removing vegetation cover, leading to increased sediment loads and increased temperatures. The objective of this study is to test the viability of a grazing potential model developed with environmental data from the U.S. Environmental Protection Agency (U.S. EPA) Environmental Monitoring and Assessment Program (EMAP) to predict spatial distribution and concentration of animal-borne bacteria (enterococci). From the Oregon EMAP project, sample sites with at least two years of measurements (197) were used for the analyses of enterococci. Of these sites, 25% (49 sites) exceeded the standard geometric mean concentration (35 cfu/100 mL). These sites were further investigated to identify trends over time (increasing/decreasing). Increasing or decreasing of the enterococci concentration at a site represents the impact of livestock presence or absence in the area. A total of 35 sites exhibited a positive or negative trend, only 13 sites had a significant positive trend and one site had a significant negative trend. Further analyses are underway in investigating spatial distribution and relationship to landscape metrics (e.g., percent riparian cover, natural cover) and nitrogen and phosphorous loads to assess potential impacts to surface water quality from livestock grazing.

Notice: The research described here has been subjected to the Agency's review and approved for publication.